REMOTE POSTAGE METER CHARGING SYSTEM USING AN ADVANCED MICROCOMPUTERIZED POSTAGE METER

The invention relates to electronic postage meter systems, and more particularly to a remote postage meter setting system having a microcomputerized postage meter of advanced design.

BACKGROUND OF THE INVENTION AND RELATED APPLICATIONS

The remote charging system of this invention uses a third generation stand alone postage meter, which supersedes the predecessor meters generally shown in copending applications, Ser. Nos. 536,248 and 406,898; filed Dec. 23, 1974 and Oct. 16, 1973, respectively.

The present microcomputerized meter is an improvement of the previous microcomputerized meter (Ser. No. 536,248). The new meter comprises means for funding the meter by entering a combination through the meter keyboard. The entered combination is compared with an internally generated combination.

The remote postage charging system of this invention funds the postage meter with variable amounts of postage rather than incremental amounts as shown in prior funding systems such as that shown in U.S. Pat. No. 3,792,446.

SUMMARY OF THE INVENTION

The invention relates to a remotely funded computerized postage meter system.

The remote funding postage meter system of the invention features a data center equipped with a programmed digital computer and a voice answer-back unit. The data center processes telephone calls from postage meter users, requesting of them information unique to their meter. This information is used to verify the authenticity of the call, and to update the record of the user stored in the digital computer. The user also informs the data center of the postage which is desired to be funded into the meter, this postage being a variable amount. The computer at the data center formulates a combination based upon the identifying information and the variable amount of postage. This combination is then transmitted back to the user via the answer back unit. The user then enters the combination into the microcomputerized postage meter. The postage meter contains a routine in its program for comparing the entered combination with an internally generated combination based upon the desired postage requested for funding. If the entered combination matches the internally generated combination, the funding registers of the meter are increased by the new postage amount. If there is no equality between the entered combination and the internally generated combination the funding register of the meter will not be increased by the requested postage, and the user will be so informed.

The postage meter of the system employs a central processing unit, a plurality of memory units, a multiplexed input and output, and postage setting means responsive to the controlled interactions between the CPU, memories, input and outputs, for setting predetermined postage and printing the postage as desired. The meter is built up about a plurality of LSI components and employs LSI technology to provide a functional relationship enabling the electronic postage meter system to accomplish its predetermined functions.

In general configuration, a central processing unit for providing the data flow control and for providing calculation of postage in accordance with input supply thereto, is the essential element of this system. Coupled to the CPU is a permanent memory for storing a postage data program and is a non-alterable storage medium. A temporary memory is also provided for storing and forwarding working data in accordance with the operation of the CPU. A non-volatile memory is intercoupled with the CPU and provides a permanent or nondestructive storage location for postal funding data in accordance with the transfer routine previously established and activated in accordance with a shut-down or start-up sequence of the system. The use of a nonvolatile memory is important in that data which is significant in the system, such as the contents of descending registers which keep track of the remaining balance in the postage meter or ascending registers which keep track of the continuous accumulation of charges thereto, is permanently stored in the nonvolatile memory when the system is de-energized. As a corollary, when the system starts up, the data from the nonvolatile memory is transferred back into the temporary memory.

Further interaction with the CPU is provided by means of an appropriate input device such as a keyboard which provides the appropriate postal data to the CPU for the calculations to be performed. An output or display which is multiplexed with the input also interfaces with the CPU for displaying data from the temporary storage in accordance with the commands. The ultimate output of the CPU is coupled to a postage setting mechanism which sets the amount of postage to be printed into a postal printing unit for printing the postage as desired.

More specifically, the microcomputerized postage meter of this invention is built upon the MCS-4^R microcomputer set; a product of Intel Corporation, Santa Clara, California. It will be understood that other manufacturers and equivalent components may be employed and that Intel components are used for purposes of example. The microcomputer set is of LSI design, and comprises a central processor unit (CPU-4004) which performs all control and data processing functions, and contains the control unit and arithmetic unit of a general purpose computer. The computerized meter comprises a plurality of ROM's (Read Only Memory Chips - 4001) and a plurality of RAM's (Random Access Memory Chips - 4002) which are interconnected to the CPU. The ROM's contain the postage system program. One four-bit input or output port is provided on each ROM package. One four-bit output port is provided on each RAM package.

The computerized meter also contains shift registers (Intel number 4003) for port expansion and multiplexing capability, and associated circuitry including clocks, power supplies and interfacing circuits to connect with the outside world.

The postage printing mechanism is one of several peripheral components including a keyboard for instructing the meter, and a display for visually monitoring the system's functions.

The postage printer of the meter is a modified Model 5300 postage meter manufactured by Pitney-Bowes, Inc., Stamford, Connecticut. The mechanical accounting means (ascending and descending registers have been removed from the meter along with the actuator assemblies and setting levers. The remaining printer is